7. Logan

Program Name: Logan.java Input File: logan.dat

Logan collects valuables of all sorts, including marbles, jewels, rocks, whatever is of interest and value to him. He keeps them in soft leather bags of assorted colors, each color unique, and has marked each bag with the weight, estimated value of the bag, and a general description of the contents. No two bags are identical. Two might weigh the same, but will be of different values. Two might have the same value, but have different weights.

He is about to load up a tote bag with as many of the colored bags as he can carry, to sell at the local flea market, but wants to maximize the value so that he can have the most value to sell. The tote bag has a weight limit he cannot exceed. He needs your help in deciding which of the colored bags he should put into the tote bag to get the most value to sell at the flea market.

For example, let's say that his tote bag has a weight capacity of 5 pounds, and he has 3 colored bags in inventory, one that is blue, another red, and a third green. The blue bag has a value of $5 and weighs 3 pounds, the red bag is worth $3 and weighs 2 pounds, and the green bag is worth $4 and only weighs 1 pound. Altogether, the three bags weigh 6 pounds, too much to carry in the selected tote bag, which means Logan must decide the best two bags to take.

He considers each combination. The blue and red bags will fit, with a total weight of 5 pounds, and a total value of $8. The red and green bags are not as valuable a combination, with 3 pounds of weight, but only a $7 value. The best value combination is blue and green, with a combined weight of only 4 pounds, but a value of $9, the best of all.

He does have tote bags of varying weight capacities, some that can handle up to 1000 pounds, and up to one hundred different colored bags that contain various precious items. Depending on the tote bag he chooses, and the number colored bags he has in his current inventory, write a program that helps Logan make the best decision about which colored bags to place in the selected tote bag in order to maximize the value of his flea market inventory.

Assumptions:
Tote bag weight range, 1 to 1000 pounds
Capacity of any colored bag, 1 to 100 pounds
Number of different colored bags, 1 to 100
Value of any particular bag, $1 to $100
Every bag has a unique single word color description, weight, and value combination, no bag the same as another.

Input: The data file will contain an initial integer N, indicating N data sets to follow. Each data set consists of an integer T representing the total weight capacity of the tote bag, an integer I indicating how many colored bags he has in inventory, followed by I sets of data, each on one line consisting of three items, an integer V representing the total value of the colored bag in dollars, an integer W indicating the weight of the colored bag in pounds, and the color of the bag. The description of the contents of the bag will not be considered in this process.

Output: For each data set, list the original weight capacity of the bag, how much of the weight capacity is used, the total value of the contents, and the colors of the bags included, listed in original order as listed in the data file. Each element of the output is shown on its own line.

(Sample input and output on next page)

(Logan, cont)

Sample input:

```
3
5
3
5 3 BLUE
3 2 RED
4 1 GREEN
6
5
1 5 BLUE
6 4 RED
4 3 GREEN
7 2 YELLOW
3 1 ORANGE
10
6
9 2 VIOLET
4 5 INDIGO
7 3 RED
6 7 PINK
2 1 BLACK
5 4 BROWN
```

Sample output:

```
5
4
$9
BLUE
GREEN
6
6
$14
GREEN
YELLOW
ORANGE
10
10
$23
VIOLET
RED
BLACK
BROWN
```